DAPHabitat System

www.daphabitat.pt

ENVIRONMENTAL PRODUCT DECLARATION

[according to ISO 14025, EN 15804:2012+A1:2013 and EN 15942]

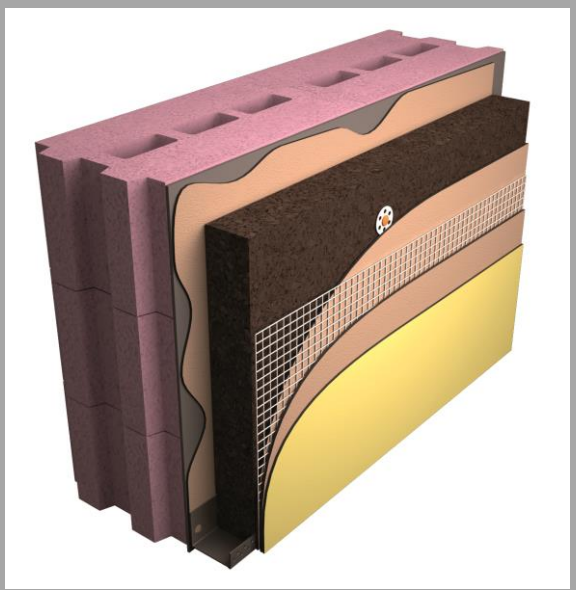
Registration number: DAP 001:2016

ECO EPD Registration Number: 00000339

SYSTEM WEBER.THERM NATURA

ISSUE DATE: 2016-01-04 VALID UNTIL: 2021-01-03

SAINT-GOBAIN WEBER



VERSION 1.1. EDITION JULY 2015

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1. GENERAL INFORMATION

1.1. The DAPHabitat System

Program operator:	Sustainable Construction Platform www.centrohabitat.net centrohabitat@centrohabitat.net
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Email address:	deptecnico@centrohabitat.net
Telephone number:	(+351) 234 401 576
Website:	www.daphabitat.pt
Logo:	

1.2. EPD OWNER

Name of the owner:	Saint-Gobain Weber Portugal, S.A.
Production site:	Industrial Center of Aveiro: Zona Industrial de Taboeira, 3800-055 Aveiro Industrial Center of Carregado: Quinta dos Cónegos, 2580-465 Carregado
Address (head office):	Centro Avelar - Tojeira, Apartado 16, 3240-908 Avelar
Telephone:	Industrial Center of Aveiro: 234 30 11 30 Industrial Center of Carregado: 263 85 04 00 Sara Lacerda (961710536)
E-mail:	sara.lacerda@saint-gobain.com; info@weber.com.pt
Website:	www.weber.com.pt
Logo:	
Information concerning the applicable management Systems:	• Saint-Gobain Weber Portugal, S.A.: Scope of certification: Design, manufacture and marketing of industrial mortars Certification NP EN ISO 9001: 2008 - certifier SGS - Compliance Certificate No. PT13 / 04354 Certification NP EN ISO 14001: 2004 - certifier SGS - Compliance Certificate No. PT13 / 04 393 Certification OHSAS 18001: 2007 - certifier SGS - Compliance Certificate No. PT13 / 04 394 Scope of certification: Manufacture of light expanded clay aggregates Certification NP EN ISO 9001: 2008 - certifier SGS - Compliance Certificate No. PT10 / 03 335 Certification NP EN ISO 14001: 2004 - certifier SGS - Compliance Certificate No. PT09 / 02 792 • Insulation product of manufacturer Amorim Isolamentos: Certificacion ACERMI - Association pour la CERtification des Matériaux Isolants

	Certification ICEA - Istituto per la Certificazione Etica ed Ambientale Certification NaturPlus - The International Association for Future-Oriented Building and Accommodation - natureplus e.V.
Specific aspects regarding the production:	SIC Code 23640: Manufacture of mortars
Organization's environmental policy:	Integrated into the Quality, Environment and Safety Policy: • Comply with the three promises of the brand: - Caring about the well-being - Caring about what matters to people - Caring about long-term liability • Develop, produce and market quality products, minimizing their environmental impact and risk and respecting legislation, standards, existing regulations and other applicable requirements ensuring customer satisfaction. • Preventing the occurrence of incidents and accidents by active management of Safety and Environment. • Preventing environmental damage by: - Promoting rational use of materials and energy resources that lead to the goal of "zero environmental accidents" and the "Maximum possible reduction of the impact of our activities." • Train and inform all employees and stakeholders to the importance of the issues of Quality, Environment and Safety. • Define goals in order to continually improve the effectiveness of the Integrated Management System (IMS).

1.3. Information concerning the EPD

Authors:	Saint-Gobain Weber Portugal, S.A. ECOCHOICE S.A.
Contact of the authors:	• Saint-Gobain Weber Portugal, S.A. Centro Aveiro: 234 30 11 30 Centro Carregado: 263 85 04 00 Sara Lacerda (961710536) • ECOCHOICE S.A. T. 213 879 412 E. marta.matos@ecochoice.pt
Emission date:	2016-01-04
Registration date:	2016-01-08
Registration number:	DAP 001:2016
ECOPlatform registration number:	---
Valid until:	2021-01-03
Representativity of the EPD (location, manufacturer, group of manufacturers):	EPD of one (1) ETICs system produced by a single producer (Saint-Gobain Weber Portugal, S.A.)
Where to consult explanatory material:	www.weber.com.pt
Type of EPD:	EPD from cradle to gate, with options (A1-A3, A4, A5)

1.4. Demonstration of the verification

External independent verification, accordingly with the standard ISO 14025:2009 and EN 15804:2012+A1:2013

Certification body	**Verifier (s)**
(CERTIF – Associação para a Certificação)	(Marisa Almeida | José Dinis Silvestre)

1.5. EPD Registration

Program Operator

(Plataforma para a Construção Sustentável)

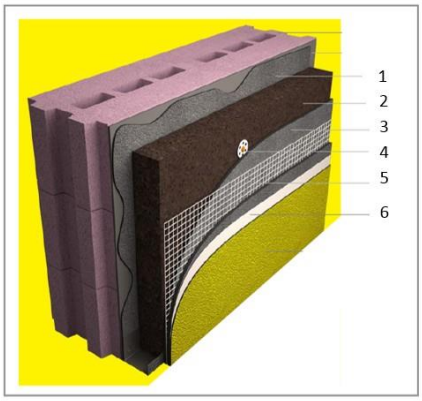
1.6. PCR of reference

Name:	PCR: basic module for construction products and services
Emission date:	Edition of February 2013
Number of registration on the data base:	RCP-mb001
Version:	Version 1.0.
Identification and contact of the coordinator (s):	António Baio dias | baiodias@ctcv.pt Marisa Almeida | marisa@ctcv.pt Luis Arroja | arroja@ua.pt
Identification and contact of the authors:	António Baio dias | baiodias@ctcv.pt Marisa Almeida | marisa@ctcv.pt Luis Arroja | arroja@ua.pt Karina Lopes | deptecnico@centrohabitat.net
Composition of the Sectorial Panel:	-
Consultation period:	01/11/2012 – 31/01/2013
Valid until:	February of 2018

1.7. Information concerning the product/product class

Identification of the product: System weber.therm natura

Illustration of the product:



1- Mortar adhesive: weber.therm kal

2- Insulation board: weber.therm cork (from Amorim Isolamentos)

3- Mortar coating (2 layers): weber.therm kal

4- Mechanical fixings: weber.therm bucha SPIT

5- Fiber mesh: weber.therm normal

6- Finishing: weber.rev naturkal

Brief description of the product: Exterior thermal Insulating ETICS system to install in building façade walls, incorporating insulating boards of natural origin.

Table 1 - Composition of the system ETICS weber.therm natura

Materials	Application	Quantity per m² of system
Weber.therm kal	Bonding and coating of insulating boards in weber.therm systems on substrates with absorption	11 kg
Weber.therm cork (Insulating cork board - ICB (110 kg/m3))	Insulating cork board from Amorim Isolamentos	4,4 kg (40 mm)
Weber.rev naturkal	Colored coating product (lime based) for interior and exterior walls	3 kg
Aluminium profile	Aluminum profile for lower system startup	0,194 kg
Screws with plastic bushings	Fixing of the aluminum profile	4 units
Mechanical fixings weber.therm bucha SPIT	Bushing with nail expansion for mechanical attachment of insulation boards	6 a 8 units
Weber.therm normal	Glass fiber mesh	0,16 kg

Table 2: Composition of the system ETICS weber.therm natura

Component	Percentage (mass)
Cork	100%

Table 3: Composition of weber.rev naturkal

Component	Percentage (mass)
Hydrated lime	15%
Cement	6,5%
Inert material	73,5%
Additives	5%

Table 4: Composition of weber.therm kal

Component	Percentage (mass)
Hydraulic lime	20%
Cement	8%
Pozzolan	5%
Inert material	62,2%
Additives	4,8%

Main technical characteristics of the product:

Table 5: Technical characteristics of insulation material (ICB):

Designation	Standard	Value	Units
Average mass density	EN 1602	110	kg/m³
Maximum mass density	EN 1602	≤130	kg/m³
Thermal conductivity	EN 13164	0,040	W/mºC
Compressive strength (10%)	EN 826	≥ 100	kPa
Water absorption	EN 1609	< 0,5	kg/m²
Class of reaction to fire	EN 13501-1	E	---

Table 6: Technical characteristics of mortar product weber.therm kal:

CE mark: EN 998-1:2010	Testing / Decision	Declared value	Units
Density	EN 1015-10	[1200-1350]	kg/m³
Adherence	EN 1015-12	≥ 0,80	N/mm²
Thermal conductivity	EN 1745 Tabulated value; P=50%	(λ10,dry) 0,45	W/m.K
Water absorption	EN 1015-18	W2	---
Permeability to water vapor	EN 1015-19	≤ 15	---
Class of reaction to fire	Commission decision 2000/147/CE	ClassF	---

Table 7: Technical characteristics of mortar product weber.rev naturkal:

CE mark: EN 998-1:2010	Testing / Decision	Declared value	Units
Density	EN 1015-10	]1000-1200]	kg/m³
Adherence	EN 1015-12	≥ 0,30	N/mm²
Thermal conductivity	EN 1745 Tabulated value; P=50%	(λ10,dry) 0,33	W/m.K
Water absorption	EN 1015-18	W1	---
Permeability to water vapor	EN 1015-19	< 15	---
Class of reaction to fire	Commission decision 2000/147/CE	Class F	---

Table 8: Technical characteristics of mechanical fixing weber.therm bucha spit:

Designation	Standard	Value	Units
Pullout resistance spacing	---	≥ 10	daN
Offset for maximum strength scaling (concrete substrate)	---	0,1	mm
Offset for maximum strength scaling (support masonry)	---	0,3	mm
Espaçamento	---	≥ 100	mm
Distance from the corner	---	≥ 100	mm
Thickness from support	---	≥ 100	mm

Table 9: Technical characteristics of fiber mesh (weber.therm rede normal/weber.therm rede reforçada):

Designation	Standard	Value	Units
a) weber.therm rede normal			
Tensile strength after aging	---	22 (> 20)	N/mm
Relative residual strength (% of value after aging in reception conditions)	---	74 (> 50)	%
Mass per unit area	---	160	g/m2
Mesh size	---	4x5	mm x mm
b) weber.therm rede reforçada			
Tensile strength after aging	---	39 (>20)	N/mm
Relative residual strength (% of value after aging in reception conditions)	---	68 (>50)	%
Mass per unit area	---	343	g/m2
Mesh size	---	6x6	mm x mm

Description of the products application:	Use:
	• External Thermal Insulation Composite System (ETICS) for facade walls in buildings, incorporating insulation board of natural origin.
	• Functional rehabilitation (impermeability, cracking and aesthetics) and improvement of thermal insulation for facades of existing buildings with ETICS type of system application incorporating insulating board of natural origin; it allows the construction works to be carried out fully on the outside, without interference with the use of the interior spaces.
	Permissible media:
	• New surfaces with flat surface:
	  ○ Concrete
	  ○ Cement plaster
	  ○ Wooden panels OSB (sepcific mortar product)
	• Flat surfaces in rehabilitation: painting, ceramic coating (others on request) using a specific mortar.

Reference service life:	Not specified
Placing on the market / Rules of application in the market / Technical rules of the product:	• Decision No. 768/2008 / EC of the European Parliament and of the Council of 9 July 2008 • Regulation (EC) No 765/2008 of the European Parliament and of the Council of 9 July 2008 • Regulation (EC) No 764/2008 of the European Parliament and of the Council of 9 July 2008 • Regulation (EU) No 305/2011 of the European Parliament and of the Council of 09 March 2011 and their rectification 12 04 2013 • ETAG 004 - composite systems with external thermal insulation coating applied over insulation
Quality control:	The identification tests and the assessment of the ability of using ETICS, according to the basic requirements, are made in accordance with ETAG 004 "Guideline for European Technical Approval of External Thermal Insulation Composite Systems with Rendering" (referred to herein as "ETAG 004").
Special delivery conditions:	Not specified
Components and substances to declare:	**Table 10: Components and chemical substances (mortar products weber.rev naturkal and weber.therm kal).**

DANGER	
Contains:	Portland Cement, Hydraulic Lime and Hydrated Lime
H318	Causes serious eye damage.
H315	Causes skin irritation.
P101	If medical advice is needed, have product container or label at hand.
P102	Keep out of reach of children.
P103	Read label before use.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310	Immediately call a POISON CENTER or doctor/physician.
P362	Take off contaminated clothing and wash before reuse.
P302+P352	IF ON SKIN: Wash with plenty of soap and water.
P501	Dispose of contents/container to in accordance with local/regional/national/ international regulation.

History of the LCA studies:	--

2. ENVIRONMENTAL PERFORMANCE OF THE PRODUCT

2.1. Calculation rules of the LCA

Declared unit:	1 m^2 of system weber.therm natura produced (packaging included) and installed (using a thermal insulation board with 40 mm thickness, 110 kg/m^2 of density and thermal conductivity of 0.040 W/mºC).
Functional unit:	--
System boundaries:	EPD from cradle to gate, with options (A1-A3, A4, A5). It was considered the production stage, transport of the different materials to the installation site and the installation of the product in a masonry wall.
Criteria for the exclusion:	Mortars and ICB: The following processes were not considered in this study, since they fell on the cut-off criteria: • The burdens of construction of industrial infrastructures and manufacture of equipment and machinery (all products); • The burdens of infrastructures (vehicle manufacturing, road maintenance) associated to transportation of pre-products and raw materials (all products); • Energy and water consumption or waste and wastewater in administrative areas and laboratories was also not considered; • Raw material packaging were considered negligible and falling in the cut-off criteria, since the raw materials with a higher percentage (in weight) in the products analysed are bought in bulk. • Waste from changing the filters in Saint-Gobain Weber, since their impact is under 1%, falling under the cut-off criteria. • Transport of propane to Saint-Gobain Weber industrial units; • Transport of diesel or lubricating oil in Amorim Isolamentos industrial unit (ICB); • Packaging of products used to treat the water in the boiler of Amorim Isolamentos was also not considered in the model, since the quantities of these products are negligible, making their packaging also insignificant the overall impacts; • The energy used during the process of separating the cork from the branches was not considered in the simulation model, since the manufacturer had no information available about this process. The dataset used for cork includes electricity and diesel burned in equipment, but there is no information if this process is equivalent to the process referred; • The transport of the auxiliary materials used in stage A5, for the installation of the prototype. There was no information available about the supplier and these have a low percentage in weight of the ETICs system (less than 4%). • The additional quantity of mortar products, ICB and auxiliary materials needed in stage A5 to compensate the 1% of waste material in each stage are not considered in the model, since we are already considering the scenario where we spend the maximum material in the installation, according to the recommended quantities in the technical specification.
Assumption and limitations:	To model the production process of the accessories used to install the system during construction stage (A5) it was used generic data from database Ecoinvent v2.2 and v3. These materials are typically purchased from various producers. It was also used generic data from Ecoinvent v2.2 and v3 to model other processes upon which producers have no influence or specific information, such as the extraction of raw materials and the production of electricity. The impacts linked to stages A1-A3 of the mortars are a simple average between the impacts of Aveiro and Carregado.
Quality and other characteristics about the information used in the LCA:	ICB data collected is from one year production in 2013.Production data collected from mortar products corresponds to the year of 2014. During this year, both mortar products were produced in Carregado, while in Aveiro weber.rev naturkal was produced only in 2013 and weber.therm kal in 2013 and 2015. Considering these facts, the specific production data from 2014 used in this study regarding Aveiro is referred to average values of mortars that do not include the mortars under study, since those are new products and are not yet being produced in a larger scale. The generic data used belongs to Ecoinvent v2.2 and v3 and meets the quality criteria (age, geographical and technology coverage, plausibility, etc.) for generic data.

Allocation rules:	Mortar products: In the industrial units of Saint-Gobain Weber it also produced other powder products that have an equivalent manufacturing process. Considering this fact, it was assumed that the energy consumption, emissions and waste production are the same for each 1 kg of powder product produced. Energy consumption, waste materials and air emissions per mass of material produced were estimated based on annual inputs/outputs of each industrial unit and the amount of powder and pastes produced. It was calculated by dividing the annual input/output for the annual production of pastes and mortar powders. ICB: In the industrial unit it is produced ICB (78,7% mass), cork granules (20,4%) and coconut fibers (0,9%). ICB production results also in the production of two co-products, cork powder and cork granulate. Cork powder has a negligible market value in comparison with ICB and cork granulate, meaning that the environmental burdens are allocated entirely to the ICB and cork granulate. For the inputs e outputs which are common to ICB and cork granules, it was performed a mass allocation of the impacts, considering a percentage of the annual production (79,4% ICB and 20,6% cork granules). For the inputs and outputs common to all products, it was also made a mass allocation of the impacts considering 78,7% of ICB, 20,4% of cork granules and 0,9% of coconut fibers.
Comparability of EPD for construction products:	The EPD of construction products and services cannot be comparable in case they are not produced according to EN 15804 and EN 15948 and according to the comparability conditions determined by ISO 14025.

2.1.1. Flow diagram of input and output of the processes

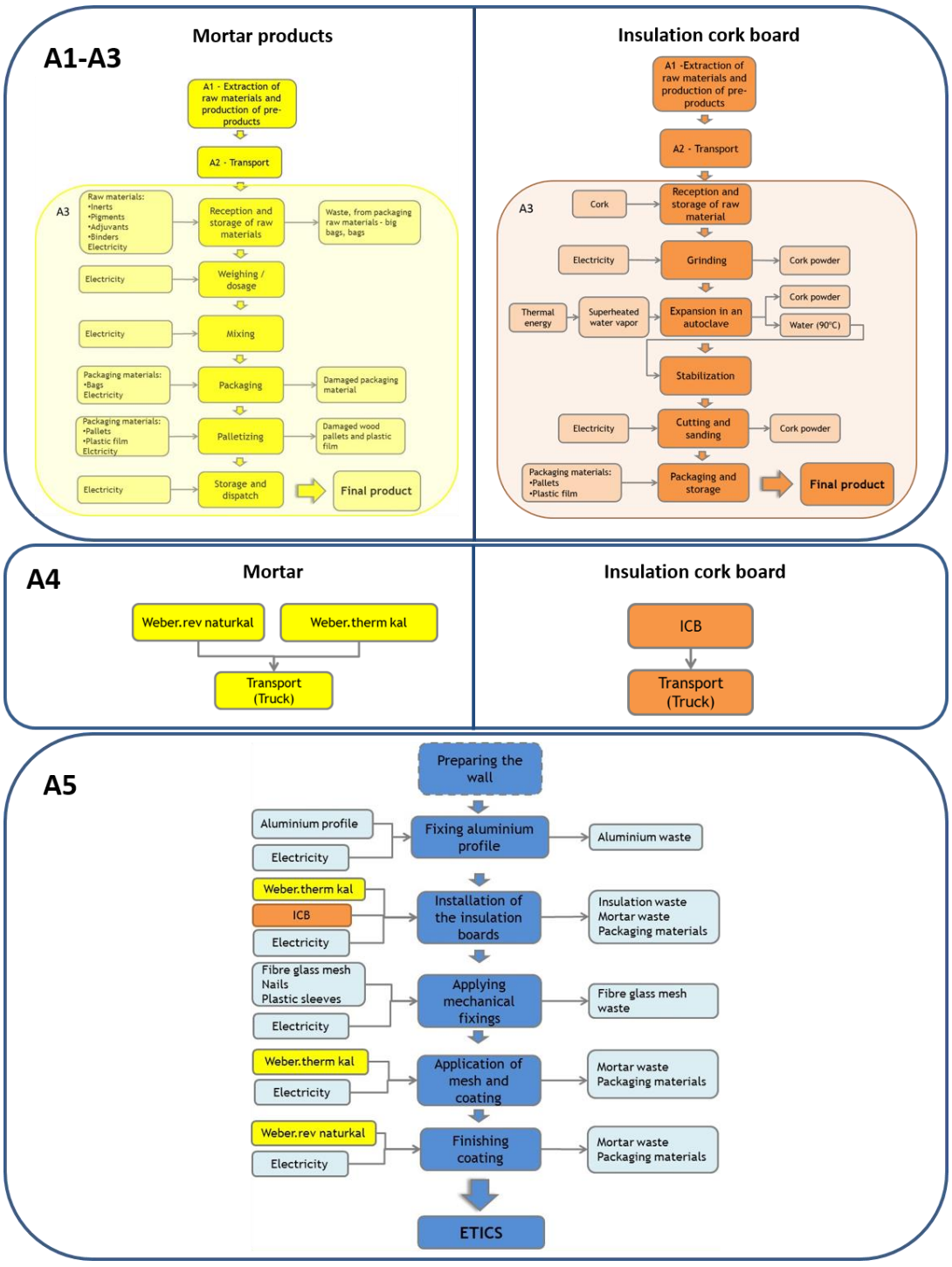


Figure 1: Life cycle stages considered in the LCA study of the system weber.therm natura.

2.1.2. Description of the system boundaries

(✓= included; ✖= module not declared)

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY
Raw material supply	Transport	Manufacturing	Transport	Construction installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-constructions, demolition	Transport	Waste processing	Disposal	Re-use, recovery, recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
✓	✓	✓	✓	✓	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖

I. Product stage – mortar products (A1-A3):

The raw materials are received in the industrial units in tankers, bags or big-bags. Storing bulk materials in silos can be made directly or through a pneumatic conveying system.

The final powder product is obtained from the mixture of different components, following a pre-established formulation. The dosage of the raw materials can be carried out by a worm screw with frequency controller and volumetric dosage through a rotary valve. The weighing of the different components is performed within one of the three weighing hoppers.

Once dosed the components are discharged into the empty blender through pneumatic valves for homogenization. The mixing time varies depending on the specific composition of the product. After this, the product falls into the hopper of the blender and is then discharged.

The last stage consists in packing and palletizing the product. Regarding powder products, they are packed in printed kraft paper bags (coated on the inside with PE film) through electric equipment and then placed on a pallet. At last, the pallet and bags are wrapped in a plastic film and covered with a plastic bag. The packed product is transported by forklift and stored until dispatch.

II. Product stage – ICB (A1-A3):

In the factory the cork is stored and afterwards is ground into granules with the appropriate size and placed in an autoclave, where overheated water vapor is injected at 370ºC. During approximately 20 minutes, and under the

effect of pressure and superheated steam, the granules expand and are agglomerated, originating blocks. This process occurs only with the natural resin (suberin) of the raw material, meaning that it does not require any extra use of any adhesives. Once formed, the blocks are forwarded to cooling stage, where recycled water is injected at a temperature of approximately 90°C. The stabilization phase, requiring any use of energy, occurs by placing the blocks in the tunnel and then in a ventilated space, during 1 week or more. After the stabilization period, the blocks are ground and cut according to the desired thickness and finishing. After this process, ICB boards are packed in PE film, palletized and forwarded to the shipping warehouse.

III. Transport of materials to the place of installation (A4):

Amorim Insulation Agglomerate Cork Board (ICB) is transported from Vendas Novas to Carregado, a distance of 72,5 km in a truck of 24 tons. The mortar products weber.therm kal and weber.rev naturkal can be transported from the factory in Aveiro to Carregado, a distance of 200 km in a truck of 24 tons or, instead, come directly from the production of Carregado unit.

IV. Installation (A5):

The installation of weber.therm natura system consists of five stages:

1. Preparing the wall: If the surface is not flat it should be cleaned.
2. Starting at ground: In a new installation, the system should be limited in its lower contour with an aluminum profile, aiding the system's assembly and protect it against external aggressions.
3. Installation of insulation boards: The insulating boards are installed in a new surface using a mortar product weber.therm kal. The boards will be installed in a vertical position in successive rows, from bottom to top, mismatched in relation to the lower row. It is required the use of mechanical fixings, dowels weber.therm bushing SPIT (in s masonry, mortar or concrete) at least 6 units per m^2. The system is perforated with the help of a drill and the circular heads of the plastic sleeves are inserted in the created holes. Then the plastic nails are hammered, to complete the fixing. The resulting small cavities are subsequently filled with mortar coating, in an operation prior to coating the boards.
4. Coating of insulation boards: The coating of insulation boards is made with the application of mortar weber.therm kal in at least two layers, incorporating a reinforcement mesh in fiber glass with anti-alkaline agent (weber.therm normal mesh).
5. Final coating: The final coating should contribute to waterproofing, protection and decoration of weber.therm systems, consisting of the decorative finishing weber.rev naturkal, applied in two layers using a stainless steel trowel, according to the desired appearance.
6. Regularization mortar: not considered in this EPD.

2.2. Parameters describing environmental impacts

		Global warming potential; GWP	Depletion potential of the stratospheric ozone layer; ODP	Acidification potential of soil and water, AP	Eutrophication potential, EP	Formation potential of tropospheric ozone, POCP	Abiotic depletion potential for non-fossil resources	Abiotic depletion potential for fossil resources
		kg CO_2 equiv.	kg CFC 11 equiv.	kg SO_2 equiv.	kg $(PO_4)^{3-}$ equiv.	kg C_2H_4 equiv.	kg Sb equiv.	MJ, P.C.I.
Raw material supply Transport Manufacturing	**A1-A3**	-6,10E-01	5,52E-07	4,78E-02	2,12E-02	5,42E-03	9,68E-06	9,40E+01
Transport	**A4**	5,74E-02	8,56E-09	1,54E-04	3,33E-05	4,68E-06	3,17E-09	8,13E-01
Construction installation process	**A5**	3,51E+00	1,99E-07	2,28E-02	2,00E-03	1,47E-03	2,62E-06	4,12E+01

LEGEND:

Product stage

Construction process stage

NOTES:

1. P.C.I. – Low Heating Value (LHV).
2. Units expressed per declared unit (1m²).
3. It was considered the capture and release of biogenic CO2 in the calculation of GWP category, in module A1-A3 of wood based products, according to the standard EN 16485:2014 and considering that the raw materials used are from forests managed according to sustainable practices. The manufacturer has a certification FSC (*Forest Stewardship Council*).
4. Considering that this EPD is from cradle to gate, the balance relative to category GWP can override the end of the life cycle of the negative value seen in the A1-A3 module for wood-based products at the time of destruction of ICB boards.

2.3. Parameters describing resource use

		Primary energy						Secondary materials and fuels, and use of water			
		EPR MJ, P.C.I.	RR MJ, P.C.I.	TRR MJ, P.C.I.	EPNR MJ, P.C.I.	RNR MJ, P.C.I.	TRNR MJ, P.C.I.	MS kg	CSR MJ, P.C.I.	CSNR MJ, P.C.I.	Net use of fresh water m^3
Raw material supply Transport Manufacturing	**A1-A3**	1,90E+02	7,76E+01	2,67E+02	8,43E+01	1,43E+01	9,86E+01	0,00E+00	*	*	6,93E-02
Transport	**A4**	1,94E-03	0,00E+00	1,94E-03	7,67E-01	0,00E+00	7,67E-01	0,00E+00	*	*	1,87E-04
Manufacturing	**A5**	1,10E+01	0,00E+00	1,10E+01	4,54E+01	3,39E+00	4,88E+01	0,00E+00	*	*	3,03E-03

LEGEND:

Product stage

Construction stage

EPR = use of renewable primary energy excluding renewable primary energy resources used as raw materials;
RR = use of renewable primary energy resources used as raw materials;
TRR = total use of renewable primary energy resources (EPR + RR);
EPNR = use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials;
RNR = use of non-renewable primary energy resources used as raw materials;
TRNR = total use of non-renewable primary energy resources (EPRN + RNR);
MS = use of secondary material;
CSR = use of renewable secondary fuels;
CSNR = use of non-renewable secondary fuels.

* Not applicable to processes in these factories and information not available for the processes upstream from the database used

NOTE: Units expressed per declared unit (1m²).

2.4. Other environmental information describing different waste categories

		Hazardous waste disposed kg	Non hazardous waste disposed kg	Radioactive waste disposed kg
Raw material supply Transport Manufacturing	**A1-A3**	8,34E-05	4,73E-01	2,94E-04
Transport	**A4**	2,09E-07	2,41E-04	1,51E-07
Construction installation process	**A5**	3,10E-05	1,01E+00	1,29E-04

LEGEND:

Product stage

Construction stage

NOTE: Units expressed per declared unit (1m²).

2.5. Other environmental information describing output flows

		Components for re-use kg	Materials for recycling kg	Radioactive waste disposed kg	Materials for energy recovery kg	Exported energy MJ per energy carrier
Raw material supply Transport Manufacturing	**A1-A3**	*	7,62E-02	2,94E-04	*	*
Transport	**A4**	*	0,00E+00	1,51E-07	*	*
Construction installation process	**A5**	*	1,15E-02	1,29E-04	*	*

LEGEND:

Product stage

Construction stage

* Not applicable to processes in these factories and information not available for the processes upstream from the database used

NOTA: Units expressed per declared unit (1m²).

3. SCENARIOS AND ADDITIONAL TECHNICAL INFORMATION

3.1. A4 Transport to the building site – Construction process stage

Parameters	Units*	Results
Fuel type and consumption of vehicle or vehicle type used for transport e.g. long distance truck, boat, etc.	Litre of fuel type per distance, or vehicle type, Commission Directive 2007/37/EC (European Emission Standard)	Diesel, 30 L/100, Truck of 24 ton
Distance	km	Mortar products: 90 km ICB insulation board: 270 km
Capacity utilization (including empty returns)	%	Considered 100%
Bulk density of transported products	kg/m^3	weber.therm kal: 1120 weber.rev naturkal: 1000 ICB insulation board: 110
Volume capacity utilisation factor (factor=1 or < 1 or > 1 for compressed or nested packaged products)	Not applicable	1
* expressed per declared unit (1m^2).		

3.2. A5 Installation of the product in the building – Construction process stage

Parameters	Units*	Results
Ancillary materials for installation (specified by material)	kg or other units as appropriate	Aluminium profile: 1,94E-01 kg Metallic screws with plastic dowels: 4 units Plastic screws: 8 units Fiber glass mesh: 1,60E-01 kg
Water use	m^3	3,84E-03: value measured on site during the installation of the model created in Carregado
Other resource use	kg	-
Quantitative description of energy type (regional mix) and consumption during the installation process	kWh	2,68E-02: value measured on site during the installation of the model created in Carregado
Waste of materials on the building site before waste processing, generated by the product's installation (specified by type)	kg	- Aluminum profile: 1,94E-03 kg; - Plastic (packaging): 3,04E-03 kg; - Wood pallets (packaging): 1,12E-03 kg; - Kraft paper (packaging): 5,60E-03 kg; - Insulation: 4,40E-02 kg; - Mortar: 1,73E-01 kg; - Fibre glass mesh: 1,71E-03 kg.
Output materials (specified by type) as result of waste processing at the building site e.g. of collection for recycling, for energy recovery, disposal (specified by route)	kg	- Aluminum profile: recycling of 1,94E-03 kg; - Plastic (packaging): recycling of 3,04E-03 kg; - Wood pallets (packaging): recycling of 1,12E-03 kg; - Kraft paper (packaging): recycling of 5,60E-03 kg; - Insulation: recycling of 4,40E-02 kg; - Mortar: disposal of 1,73E-01 kg; - Fibre glass mesh: recycling of 1,71E-03 kg.
Direct emissions to ambient air, soil and water	kg	-
* expressed per declared unit (1m^2).		

3.3. B1 Use stage

(Relevant information about the use of the product) if applicable

3.4. B2 Maintenance

Maintenance process (Description or source where description can be found)

Process	Units*	Results
Maintenance cycle	Number per RSL or year	N/A
Ancillary materials for maintenance e.g. cleaning agent, specify materials	kg/cycle	N/A
Waste material resulting from maintenance (specify materials)	kg	N/A
Net fresh water consumption during maintenance	m^3	N/A
Energy input during maintenance e.g. vacuum cleaning, energy carrier type, e.g. electricity, and amount, if applicable and relevant	kWh	N/A
[1]Description of other scenarios	Units as appropriate	N/A
* expressed per declared unit ($1m^2$).		

3.5. B3 Repair

Repair process (Description or source where description can be found)

Inspection process (Description or source where description can be found))

Process	Units*	Results
Repair cycle	Number per RSL or year	N/A
Ancillary materials, e.g. lubricant, specific materials	Kg or kg/ cycle	N/A
Waste material resulting from repair (specify materials)	kg	N/A
Net fresh water consumption during repair	m^3	N/A
Energy input during repair, e.g. crane activity, energy carrier type, e.g. electricity, and amount	kWh /RSL, kWh / cycle	N/A
[2]Description of other scenarios	units as appropriate	N/A
* expressed per declared unit ($1m^2$).		

[1] In case there are no more described scenarios, this line should be eliminated in the final document.
[2] In case there is no more described scenarios, this line should be eliminated in the final document

3.6. B4 Replacement

Process	Units*	Results
Replacement cycle	Number per RSL or year	N/A
Energy input during replacement, e.g. crane activity, energy carrier type, e.g. electricity and amount if applicable and relevant	kWh	N/A
Exchange of worn parts during the product's life cycle, e.g. zinc galvanized steel sheet, specify materials	kg	N/A
[5] Description of other scenarios	units as appropriate	N/A
* expressed per declared unit (1m²).		

3.7. B5 Refurbishment

Refurbishment process (Description or source where description can be found)

Process	Units*	Results
Refurbishment cycle	Number per RSL or year	N/A
Energy input during refurbishment, energy carrier type e.g. electricity, and amount if applicable and relevant	kWh	N/A
Material input for refurbishment e.g. bricks, including ancillary materials for the refurbishment process e.g. lubricant	kg or kg/cycle	N/A
Waste material during from refurbishment	kg	N/A
[3] Further assumptions for scenario development e.g. frequency and time period of use, number of occupants	units as appropriate	N/A
* expressed per declared unit (1m²).		

3.8. B6 Use of energy

Parameters	Units*	Results
Ancillary materials specified by material	kg or units as appropriate	N/A
Net fresh water consumption	m^3	N/A
Type of energy carrier e.g. electricity, natural gas, district heating	kWh	N/A
Power output of equipment	kW	N/A
Characteristic performance e.g. energy efficiency, emissions, variation of performance with capacity utilization, etc	units as appropriate	N/A
[6]Further assumptions for scenario development e.g. frequency and period of use, number of occupants	units as appropriate	N/A
* expressed per declared unit (1m²).		

[3] In case there are no more described scenarios, this line should be eliminated in the final document.

3.9. Use of water

Parameters	Units*	Results
Ancillary materials specified by material	kg or units as appropriate	N/A
Net fresh water consumption	m^3	N/A
Type of energy carrier e.g. electricity, natural gas, district	kWh	N/A
Power output of equipment	kW	N/A
Characteristic performance e.g. energy efficiency, emissions, variation of performance with capacity utilization, etc.	units as appropriate	N/A
[6] Further assumptions for scenario development e.g. frequency and period of use, number of occupants	units as appropriate	N/A
* expressed per declared unit ($1m^2$).		

3.10. [C1 – C4] End of life of the product

Processes	Units*	Results
Collection process specified by type	kg collected separately	N/A
	kg collected with mixed construction waste	N/A
Recovery system specified by type	kg for re-use	N/A
	kg for recycling	N/A
	kg for energy recovery	N/A
Disposal specified by type	kg product or material for final deposition	N/A
[4] Assumptions for scenario development e.g. transportation	units as appropriate	N/A
Definition of scenario[7]	units as appropriate	N/A
* expressed per declared unit ($1m^2$).		

[4] In case there is no more described scenarios, this line should be eliminated in the final document

3.11. Additional information on release of dangerous substances to indoor air, soil and water during the use stage

Scenario title	Parameters	Units*	Results
Release scenario Indoor air	**Test results according to CEN/TC 351**		N/A
	Description scenario 1[7]	units as appropriate	N/A
	Description scenario n[7]	units as appropriate	N/A
Release scenario Soil	**Test results according to CEN/TC 351**		N/A
	Description scenario 1[7]	units as appropriate	N/A
	Description scenario n[7]	units as appropriate	N/A
Release scenario Water	**Test results according to CEN/TC 351**	(…)	N/A
	Description scenario 1[7]	units as appropriate	N/A
	Description scenario n[7]	units as appropriate	N/A

* expressed per declared unit (1m²).

Note: Emissions to indoor air and releases to soil and water according to the horizontal standards on measurement of release of regulated dangerous substances from construction products using harmonised testing methods according to the provisions of the respective Technical Committees for European product standards, when available.

REFERENCES

✓ General Instructions of the DAPHabitat System, Version 1.0, Edition March 2013 (in www.daphabitat.pt);

✓ **PCR – basic module for construction products and services.** DAPHabitat System. Version 1.0, 2013 (in www.daphabitat.pt);

✓ **ISO 14025:2009** Environmental declarations and labels – Type III environmental declarations – Principles and procedures;

✓ **EN 15804:2012+A1:2013** Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products;

✓ **EN 15942:2011** Sustainability of construction works – Environmental product declarations – Communication format business-to-business.